

REMARKS

Claims in the case are 1 and 3-7, upon entry of this amendment. Claims 1 and 3-7 have been amended, and Claims 2 and 8-25 have been cancelled without prejudice herein. No claims have been added herein.

The claims have been amended as to form and for purposes of improved clarity, for example, by modifying punctuation, including indentation, and replacing "as defined in" with --of--.

Basis for the amendments to Claim 1 with regard to the texture being uniform both through the thickness and from the center to the edge of the plate, are found at page 11, paragraph 39, and in particular at lines 7-9 of paragraph 39 of the specification. Basis for the amendments to Claim 1 with regard to the {100} and {111} crystallographic orientations is found at page 11, paragraph 39, and in particular at lines 11-15 of paragraph 39 of the specification.

Applicants note with appreciation the Office's acknowledgment of their election without traverse of Group-I (i.e., Claims 1-7) with regard to the Restriction Requirement of 30 December 2003.

Claim 2 stands objected to in the Office Action of 16 March 2003. Claim 2 has been cancelled herein. As such, the objection of Claim 2 is deemed to be moot.

Claims 1-5 stand rejected under 35 U.S.C. §102(e) as being anticipated by United States Patent No. 6,331,233 B1 (Turner). This rejection is respectfully traversed with regard to the amendments herein and the following remarks.

Turner discloses a tantalum sputtering target that has a uniform crystallographic texture through the thickness of the target. See the abstract; column 1, lines 8-12; and column 4, lines 50-54 of Turner.

Turner, however, provides no disclosure with regard to his tantalum sputtering target having uniform crystallographic texture from the center to the edge of the target. In particular, Turner provides no disclosure with regard to a tantalum sputtering target having texture that is uniform both through the thickness of the target and at the same time from the center to the edge of the target.

In addition, Turner provides no disclosure with regard to his tantalum sputtering target having a distribution of {100} and {111} crystallographic orientations

that varies by less than 30 percent across the surface of any plane that is orthogonal relative to the thickness of the target. Further, Turner provides no disclosure with regard to his tantalum sputtering target having a distribution of {100} and {111} crystallographic orientations that varies by less than 30 percent across any thickness of the target.

Applicants submit that the process disclosed by Turner necessarily results in tantalum sputter targets that have a different strain history between the center and outer edges of the target, as would be recognized by a skilled artisan. This differential strain is introduced into the target during Turner's stage-2 deformation. During Turner's second deformation stage, the edge area of the target / plate is subjected to a moderate level of strain; while the center area is subjected to a relatively low level of strain near the upper and lower surfaces of the plate, and a high level of strain in the interior (mid-thickness) of the plate. Such a disparity in strain can not be sufficiently homogenized by annealing, rolling or re-annealing, and as such necessarily results in a non-uniform texture from the center to the edge of Turner's sputtering targets. See column 3, lines 49 through column 4, lines 26; and Table-1, columns 5 and 6 of Turner.

In light of the amendments herein and the preceding remarks, Applicants' claims are deemed to be unanticipated by and patentable over Turner.
Reconsideration and withdrawal of this rejection is respectfully requested.

Claims 1-5 stand rejected under 35 U.S.C. 102(e) as being unanticipated by United States Patent No. US 6,348,113 B1 (Michaluk '113). This rejection is respectfully traversed in light of the amendments herein and the following remarks.

Michaluk '113 discloses a high purity tantalum product that has primarily (111)-type texture substantially throughout the thickness thereof. See column 2, lines 20-27 of Michaluk '113.

Michaluk '113, however, does not disclose a tantalum product having texture that is uniform both through the thickness of the product and at the same time from the center to the edge of the target.

Michaluk '113 provides no disclosure with regard to their tantalum product having a distribution of {100} and {111} crystallographic orientations that varies by

less than 30 percent across the surface of any plane that is orthogonal relative to the thickness of the target. Further, Michaluk '113 provides no disclosure with regard to their tantalum product having a distribution of {100} and {111} crystallographic orientations that varies by less than 30 percent across any thickness of the product.

Applicants submit that the process disclosed by Michaluk '113 would not result in a tantalum product having uniform texture falling within or approximating that of the refractory metal plate of their present claims. Attention is directed to the examples of Michaluk '113. In particular, in Figure 2, which is representative of a preferred embodiment of Michaluk '113, the (111)-type texture intensity varies from 0.304 to 6.722, the plate thereof accordingly having a (111)-type texture intensity minimum to maximum ratio of 1:22. With further reference to Figure 2 of Michaluk '113, the plate has a (100)-type texture that varies from 0.091 to 3.998, the plate thereof accordingly having a (100)-type texture intensity minimum to maximum ratio of 1:44. Further particularly, in Figure 8, which is representative of another preferred embodiment of Michaluk '113, the (111)-type texture intensity varies from 2.127 to 11.219, the plate thereof accordingly having a (111)-type texture minimum to maximum ratio of 1:5. With further reference to Figure 8 of Michaluk '113, the plate has (100)-type texture that varies from 0.425 to 6.911, the plate thereof accordingly having a (100)-type texture minimum to maximum ratio of 1:16. As such, the tantalum products prepared by the method of Michaluk '113 have substantially non-uniform texture through the thickness thereof.

In light of the amendments herein and the preceding remarks, Applicants' present claims are deemed to be unanticipated by and patentable over Michaluk '113. Reconsideration and withdrawal of the present rejection is respectfully requested.

Claims 1-7 stand rejected under 35 U.S.C. §102(b) as being anticipated by International Publication No. WO 99/66100 (**Shah et al**), which was published under the Patent Cooperation Treaty. This rejection is respectfully traversed with regard to the amendments herein and the following remarks.

Shah et al disclose a method of preparing a metal article (e.g., of tantalum or niobium) that has uniform (100) crystallographic texture. See the abstract and page 8, lines 15-17 of Shah et al.

Shah et al is silent as to and provides no disclosure with regard to the (111) crystallographic texture of their metal articles. As such, Shah et al provides no disclosure with regard to a refractory metal plate that has a distribution of {100} and {111} crystallographic orientations that varies by less than 30 percent across the surface of any plane thereof that is orthogonal relative to the thickness of the target. Further, Shah et al provides no disclosure with regard to a refractory metal plate having a distribution of {100} and {111} crystallographic orientations that varies by less than 30 percent across any thickness of the target.

In light of the amendments herein and the preceding remarks, Applicants' claims are deemed to be unanticipated by and patentable over Shah et al. Reconsideration and withdrawal of this rejection is respectfully requested.

Claims 1-3 and 6-7 stand rejected under 35 U.S.C. §102(e) as being anticipated by United States Patent Application Publication No. US 2002/0072475 A1 (Michaluk '475). This rejection is respectfully traversed with regard to the amendments herein and the following remarks.

Michaluk '475 discloses niobium metal products (e.g., sputtering targets) that have (111)-type texture through the thickness of the product, and/or an absence of strong (100)-type texture bands within the thickness of the niobium product. See the abstract and paragraph [0019] of Michaluk '475.

However, as described by Michaluk '475, the texture of their niobium metal products is not particularly uniform. The natural log ratios of (111):(100) center peak intensities of Michaluk '475 are in fact indicative of a lack of uniform texture, which is similar to that as discussed previously herein with reference to Michaluk '113.

Michaluk '475 does not disclose a niobium metal product having texture that is uniform both through the thickness of the product and at the same time from the center to the edge of the product.

Michaluk '475 provides no disclosure with regard to their niobium metal product having a distribution of {100} and {111} crystallographic orientations that

varies by less than 30 percent across the surface of any plane that is orthogonal relative to the thickness of the product. Further, Michaluk '475 provides no disclosure with regard to their niobium metal product having a distribution of {100} and {111} crystallographic orientations that varies by less than 30 percent across any thickness of the product.

In light of the amendments herein and the preceding remarks, Applicants' claims are deemed to be unanticipated by and patentable over Michaluk '475. Reconsideration and withdrawal of this rejection is respectfully requested.

Claims 1 and 3 stand rejected under 35 U.S.C. §102(b) as being anticipated by JP 2000-104164 (**Fujioka et al**). With regard to the amendments herein and the following remarks, this rejection is respectfully traversed.

Fujioka et al disclose a niobium sputter target that contains less than 3000 ppm of tantalum. The niobium sputter targets of Fujioka et al are further disclosed as having variations of tantalum that are within plus-or-minus 30% through the whole target. See the English language abstract of Fujioka et al.


However, Fujioka et al do not disclose a niobium sputter target having texture that is uniform both through the thickness of the target and at the same time from the center to the edge of the target.

Fujioka et al provides no disclosure with regard to their niobium sputter target having a distribution of {100} and {111} crystallographic orientations that varies by less than 30 percent across the surface of any plane that is orthogonal relative to the thickness of the target. Further, Fujioka et al provide no disclosure with regard to their niobium sputter target having a distribution of {100} and {111} crystallographic orientations that varies by less than 30 percent across any thickness of the product.

In light of the amendments herein and the preceding remarks, Applicants' claims are deemed to be unanticipated by and patentable over Fujioka et al. Reconsideration and withdrawal of the present rejection is respectfully requested.

In light of the amendments herein and the preceding remarks, Applicants' presently pending claims are deemed to define an invention that is unanticipated, unobvious and hence, patentable. Reconsideration of the rejections and allowance of all of the presently pending claims is respectfully requested.

Respectfully submitted,

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